

Low Power Miniature Colloidal High Vacuum Pump, Phase I

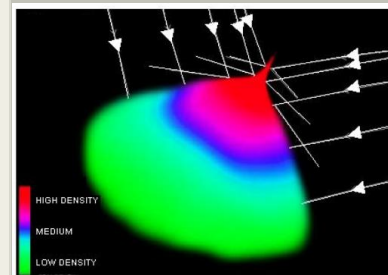
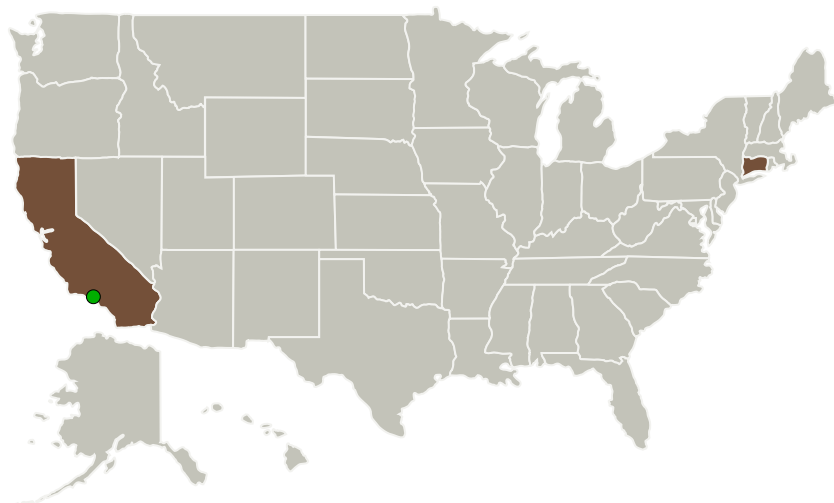
Completed Technology Project (2015 - 2015)



Project Introduction

Shortly after NASA made the most recent planetary science SBIR topics public, we began discussing the possibility of translating our experience in maximizing momentum transfer by specialized electrospray jets into a vacuum for micro-satellite propulsion as a new alternative to the diffusion pump concept. Indeed, what is currently being done for "colloidal propulsion" parallels the requirements for an effective vapor-jet pump. The attractive feature of colloidal droplets produced by the electrospray phenomena is significant. Principal among these is the lack of volatility of the working fluid, negating the need for diffusion pump heater concepts, and the ability to produce ions or droplets at a known velocity that exceed the thermal velocity of target pump gases using only milliwatts of power. Over the past 30+ years, no significant advance in vacuum pump concepts save for the turbo-molecular pump has been realized. The proposed technology offers a potential for game-changing new technology that may obviate a turbo pump in many applications while promising to provide significant cost savings with unprecedented reliability and longevity.

Primary U.S. Work Locations and Key Partners



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Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Project Transitions	2
Images	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	2
Technology Areas	3
Target Destinations	3

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Organizations Performing Work	Role	Type	Location
Connecticut Analytical Corporation	Lead Organization	Industry	Bethany, Connecticut
● Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations	
California	Connecticut

Project Transitions

▶ **June 2015:** Project Start

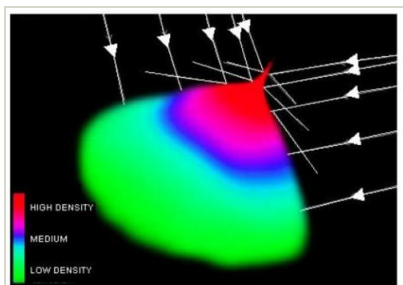
✓ **December 2015:** Closed out

Closeout Summary: Low Power Miniature Colloidal High Vacuum Pump, Phase I Project Image

Closeout Documentation:

- Final Summary Chart Image(<https://techport.nasa.gov/file/139182>)

Images



Briefing Chart Image

Low Power Miniature Colloidal High Vacuum Pump, Phase I
(<https://techport.nasa.gov/image/130590>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Connecticut Analytical Corporation

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

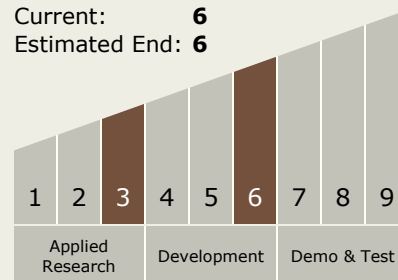
Joseph Bango

Technology Maturity (TRL)

Start: **3**

Current: **6**

Estimated End: **6**



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Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.1 Remote Sensing Instruments/Sensors
 - └ TX08.1.1 Detectors and Focal Planes

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System